STATEMENT OF WORK FOR THE REMEDIAL DESIGN AND REMEDIAL ACTION AT AMERICAN CHEMICAL SERVICES SITE LAKE COUNTY GRIFFITH, INDIANA

I. PURPOSE

The purpose of this Statement of Work (SOW) is to set forth requirements for implementation of the remedial action set forth in the Record of Decision (ROD), which was signed by the Regional Administrator of U.S. EPA Region V on September 30, 1992, for the American Chemical Services (ACS) Site (Site). The Settling Defendants shall follow the ROD, the SOW, the approved Pre-Design Work Plan, the approved Remedial Design Work Plan, the approved Remedial Action Work Plan, U.S. EPA Superfund Remedial Design and Remedial Action Guidance and any additional guidance specified by U.S. EPA in submitting deliverables for designing and implementing the remedial action at the ACS Site.

II. DESCRIPTION OF THE SITE, REMEDIAL ACTION, AND PERFORMANCE STANDARDS

ACS is located at 420 S. Colfax Ave., Griffith, Indiana, and includes ACS property (19 acres), Pazmey Corp. property (formerly Kapica Drum, Inc, now owned by Darija Djurovic.; two acres) and the inactive portion of the Griffith Municipal Landfill (approximately 15 acres). The ACS Superfund Site includes all these properties (Figure 1). The site is bordered on the east and northeast by Colfax Avenue. The Chesapeake and Ohio railway bisects the site in a northwest-southeast direction, between the fenced On-site Area (north) and the Off-site Area (south). On the west and northwest, south of the Chesapeake and Ohio railway, the site is bordered by the abandoned Erie and Lackawanna railway and the active portion of the Griffith Municipal Landfill. North of the Chesapeake and Ohio railway, the site is bordered on the west by wetland areas. The northern boundary of the site is formed by the Grand Trunk railway. Surface water runoff is generally to the west and south. Surface water runoff appears to be confined to the site by drainage to the wetlands and subsequent infiltration. There appears to be no direct connection between site surface water drainage and local streams, however, ground water does discharge to the wetlands and the wetlands are ultimately drained by Turkey Creek, approximately 1 1/2 miles south of the site. Developed land around the site is used for single family residences and industrial purposes.

Settling Defendants shall design and implement the Remedial Action to meet the performance standards and specifications set forth in the ROD and this SOW. Performance standards shall include cleanup standards, standards of control, quality criteria and other substantive requirements, criteria or limitations including all

Applicable or Relevant and Appropriate Requirements (ARARs) set forth in the ROD, SOW and/or Consent Decree. Cleanup Standards have been set for the site based on the risk assessment developed for the Site, U.S. EPA's Risk Assessment Guidance for Superfund (RAGS), and Federal, State, and local regulations.

The major components of the selected remedial action include:

- Ground water pumping and treatment system to dewater the site and to contain the contaminant plume with subsequent discharge of the treated ground water to surface water and wetlands;

- Excavation of approximately 400 drums in the On-site Containment Area for offsite incineration;

- Excavation of buried waste materials/Source Areas (as defined in the ROD and this SOW) and treatment by low-temperature thermal treatment (LTTT). Treatment residuals meeting performance standards will be re-deposited on-site.

- On-site treatment or off-site disposal of treatment condensate;

- Vapor emission control during excavation and possible immobilization of inorganic contaminants after LTTT;

- Off-site disposal of miscellaneous debris;

- In-situ vapor extraction pilot study of buried waste in On-site Area;

- In-situ vapor extraction of contaminated soils;

- Continued evaluation and monitoring of wetlands and, if necessary, remediation;

- Long term ground-water monitoring;

- Fencing the site and possible implementation of deed and access restrictions and deed notices; and

- Private well sampling with possible well closures or ground water use advisories.

A. Site Security

The Settling Defendants shall install and maintain a fence at the Site to prevent access and vandalism to the Site. Fencing of the Site shall consist of a chain link fence around the perimeter which is a minimum six-feet high with a minimum three-strand barbed wire. The fence shall border, at a minimum, the ACS site as shown in

Figure 1. The exact location of the fence will be identified in the pre-design work plan and approved by U.S. EPA. Warning signs shall be posted at 200-foot intervals along the fence and at all gates. The warning signs shall advise that the area is hazardous due to chemicals in the soils which pose a risk to public health through direct contact. The signs shall also provide a telephone number to call for further information. The fence shall be completed as part of pre-design activities.

B. Restrictive Covenants/Deed Restrictions

Within 15 days after the entry of this Consent Decree, Settling Defendants shall execute and record with the Lake County recorder restrictive covenants to ensure that, except for construction required by this SOW, no construction or installation of drinking water wells occurs on-site which may increase the likelihood of exposure to remaining contaminants; and to ensure that there is no interference with the operation and maintenance of treatment and monitoring systems required by this remedial action. Settling defendants shall exercise their best efforts to implement these deed and access restrictions.

C. Identification of contaminated ground water

Settling Defendants shall perform sufficient additional sampling to identify the horizontal and vertical extent of ground water contamination in order to access the degree of off-site contaminant migration and to design an effective ground water treatment system.

D. Identification of buried waste and contaminated soils for Low-Temperature Thermal Treatment (LTTT) and In-situ Vapor Extraction (ISVE)

Settling Defendants shall fully identify the horizontal and vertical extent of buried waste and soils contaminated at levels exceeding any of the Cleanup Standards described in the ROD. These Cleanup Standards are listed in Appendix A. Settling Defendants may utilize a procedure which uses:

1. Field screening for identification and delineation of source areas to be excavated;

2. Remedial investigation data to approximately locate treatment systems; and

3. Confirmational sampling and analysis after excavation of source areas to be treated by LTTT and after ISVE soil treatment to verify removal of all contaminates exceeding

the Cleanup Standards set forth in Appendix A, provided they submit to U.S. EPA and the State (as part of the RD work plan) a plan detailing such a procedure.

E. Construction, Installation and Operation of Treatment Systems for Remedial Action

1. Groundwater Restoration System

The Settling Defendants shall design and install a groundwater extraction and treatment system to restore groundwater to performance standards. The Settling Defendants shall operate the groundwater extraction system until the groundwater performance standards (cleanup standards) are met throughout the Area of Attainment. The Area of Attainment for groundwater Cleanup Standards shall include all areas outside the site boundary where contamination levels exceed the performance standards. These groundwater performance standards shall consist of MCLs for those individual carcinogenic contaminants where the MCL corresponds to a cancer risk of less than 1 x 10-6. For individual contaminants where the MCLs exceed a 10-6 carcinogenic risk, the performance standards for the individual contaminants shall be levels that equal a carcinogenic risk of 1 x 10-6. The performance standards for individual noncancer contaminants consist of levels that represent a noncancer risk of Hazard Quotient (HQ) = 1. The performance standards are listed in Table 7 of the ROD which is attached hereto as Appendix B.

There are fifteen carcinogenic contaminants in Appendix B. Ten carcinogenic contaminants have performance standards set at a 1 x 10-6 level, resulting in a cumulative cancer risk of 1 x 10-5 for these ten contaminants. The other five carcinogenic contaminants have performance standards set at MCLs, resulting in a cumulative cancer risk of 3 x 10-6, for these five contaminants. The total cancer risk for the fifteen carcinogenic contaminants is therefore 1.3 x 10-5.

In the event risk-based performance standards for individual contaminants cannot be attained, the performance standards shall be based on a cumulative risk that shall not exceed a 1.3 x 10-5 cumulative cancer risk and a Hazard Index (HI) < 1.0 cumulative noncancer risk. Performance standards for individual contaminants based on MCLs cannot be exceeded.

If additional compounds are found to be above MCLs or Health based standards as identified in the ROD during any monitoring event, those compounds shall be added to Appendix B and Table 7 of the ROD and an appropriate groundwater performance standard will be calculated by U.S. EPA, after reasonable

opportunity for review and comment by the State. The cumulative carcinogenic risk of 1.3 x 10-5 and cumulative HI less than 1.0, as specified in the ROD, shall not be exceeded. The carcinogenic risk and HI shall be calculated using the methods set forth in the Risk Assessment Guidance for Superfund (RAGS).

The Settling Defendants shall install and operate an extraction system that shall consist of a network of wells designed to completely capture and remove contaminated groundwater within and downgradient of the point of compliance defined in the ROD as the down-gradient site boundary. The Settling Defendants shall design the extraction wells to be capable of pumping sufficient quantities of groundwater to capture and extract the entire contaminated plume within the area of attainment.

The Settling Defendants shall pump the extracted groundwater to the groundwater treatment system for removal of chemicals to their discharge performance standards, as approved by U.S. EPA, after reasonable opportunity for review and comment by the State, prior to discharge to Turkey Creek or one of its tributaries and the western wetlands. Settling defendants shall meet all conditions and limitations imposed by U.S. EPA, after reasonable opportunity for review and comment by the State, on discharge of treated groundwater into surface waters and wetlands. The specifics of the groundwater treatment process shall be implemented as determined by U.S. EPA, after reasonable opportunity for review and comment by the State, during design. The groundwater treatment process is expected to include technologies involving air stripping, UV/Oxidation, chemical precipitation, and carbon absorption. Residuals from the ground water pump and treat process will be sent off-site for disposal or recycling, as appropriate.

The Settling Defendants shall monitor the system's performance for a minimum of 30 years. U.S. EPA, after reasonable opportunity for review and comment by the State, may require adjustments or enhancements to the system as warranted by the performance data collected during operation. Examples of adjustments which U.S. EPA may require include, but are not limited to, additional groundwater extraction wells, increased pumping rates, pulsed pumping, injection wells, nutrient introduction and bioremediation.

If, after full operation of the groundwater extraction and treatment system for a period of at least five (5) years, and operation of the system following implementation of any and all modifications required by U.S. EPA, after reasonable opportunity for review and comment by the State, for at least three (3) years, Settling Defendants believe that it is technically impracticable to achieve the Cleanup Standards set

forth above, then Settling Defendants may petition to U.S. EPA to modify the Cleanup Standards, based on a demonstration, in accordance with the provisions of Section 121(d)(4)(C) of CERCLA, that compliance with the Cleanup Standards is technically impracticable from an engineering perspective.

The Settling Defendants may petition U.S. EPA to terminate the groundwater extraction and treatment system after a demonstration that the groundwater performance standards have been met throughout the area of attainment. The demonstration shall consist of three years of consecutive quarterly monitoring during which none of the contaminants exceeds any performance standard in any of the wells in the monitoring network. Monitoring shall be for U.S. EPA Contract Laboratory Program's Target Analyte List/Target Compound List and other parameters approved during design. Upon U.S. EPA's approval of the petition, after reasonable opportunity for review and comment by the State, Settling Defendants may terminate the groundwater extraction treatment system. Review of the petition shall be in accordance with the Consent Decree.

U.S. EPA may require Settling Defendants to continue full or partial operation of the extraction and treatment system after Cleanup Standards are achieved, if U.S. EPA, after reasonable opportunity for review and comment by the State, determines that hydraulic containment to prevent the migration of contaminants exceeding the Cleanup Standards set forth above is necessary to protect human health and the environment.

After termination of the operation of the groundwater extraction and treatment system, Settling Defendants shall reactivate the groundwater extraction and treatment system immediately if any groundwater monitoring indicates that the groundwater performance standards are exceeded at any point of compliance as defined in Section II.F.5. of this SOW.

Air emissions from the groundwater treatment system shall not exceed the standards set forth in Section II.F.3.

2. Excavation and Treatment of Buried Waste

The Settling Defendants shall excavate and treat all buried waste that are or that contain hazardous substances, pollutants or contaminants above the performance standards identified in Appendix A by thermal treatment in an on-site low-temperature thermal treatment (LTTT) Unit. Settling Defendants shall perform treatability tests designed to determine operating parameters needed for LTTT to achieve remediation levels set forth in Appendix A. The following soils and waste are considered buried waste and will be excavated and treated by LTTT to meet clean up standards:

- Areas of Contamination with total Volatile Organic Compounds (VOCs) in excess of 10,000 ppm in the Off-site Area (as defined in the ROD and this SOW);

- Soils contaminated with PCBs at a level greater than 10 ppm in both the On-site and Off-site Areas; and

- Isolated VOC-contaminated soil not within the areas to be addressed by In-situ Soil Vapor Extraction (ISVE).

The Settling Defendants shall treat source material to obtain the performance standards outlined in Appendix A. The cumulative carcinogenic risk of 3.3 x 10-5 and cumulative HI < 1.0, as specified in the ROD, shall not be exceeded. The 3.3 x 10-6 cumulative cancer risk is based on the fact that thirty-three individual carcinogenic contaminants have performance standards set at a 1 x 10-6 risk level. The carcinogenic risk and hazard index shall be calculated using the methods set forth in RAGS. The Settling Defendants shall test the treatment residuals and redeposit the residuals on-site if all treatment standards specified in Appendix A are attained. LTTT treatment residuals must contain less than 2 ppm PCBs to be redeposited on-site.. A 10-inch clean soil cover shall be placed over PCB-contaminated areas greater than 1 ppm and less than 10 ppm. The Settling Defendants shall manage other residues and condensate from the treatment process in accordance with the approved design.

Soils containing greater than 500 ppm lead in both the On-Site and Off-Site Areas will also be excavated, possibly treated by LTTT to remove VOCs and SVOCs (if fugitive emissions exceed ambient air monitoring standards), and sent off-site for disposal. Contaminated soils that fail the TCLP characteristic hazardous waste test for any constituent without an identified cleanup standard shall be sent off-site for disposal.

Air emissions from the LTTT system shall not exceed the standards set forth in Section II.F.3.

The Settling Defendants shall excavate intact buried drums and send them off-site to a licensed hazardous waste incinerator. Miscellaneous debris removed during excavation activities will be steam-cleaned within the area of contamination and sent off-site for disposal. The Settling Defendants shall manage condensate or other residue from the treatment process in accordance with the approved design. Air emissions from the LTTT system shall not exceed the standards set forth in Section II.F.3.

3. In-situ Vapor Extraction Pilot Study

Settling Defendants shall have the option to design and construct an ISVE pilot project to be implemented in the On-site Area to evaluate the effectiveness of the technology on buried waste materials. This pilot study will be in conjunction with the ISVE system to be developed for all contaminated site soils, as described in Section II.E.4. With U.S. EPA's approval, after consultation with the State, studies assessing ISVE's effectiveness on buried waste material may be abandoned in favor of implementing LTTT for all buried wastes.

The performance criteria and the design and schedule of the pilot study shall be established in the Pre-Design Work Plan. The performance period will be a minimum of two months but no longer than the time it takes to implement treatment for source materials in the Off-site Area.

The Pre-Design Work Plan shall include, at a minimum, the location within the On-site Area where the pilot study is to be conducted, the operation parameters, i.e., number of extraction wells, pumping rate, etc., to be used during the pilot study, and the time necessary to conduct and complete the pilot study. At the conclusion of the Pilot Study performance period, the Settling Defendants shall present the results through a Pilot Study Report. The underlying data developed during the Pilot Study shall be made available to the U.S. EPA and the State upon request. The Pilot Study shall determine the most efficient design parameters for full-scale implementation of ISVE in the On-site Area. The design parameters shall include, at a minimum, the number of extraction and injection wells, spacing between wells, extraction pumping rate, and off-gas treatment requirements.

The Settling Defendants shall conduct sampling activities to characterize the physical parameters of the buried waste source areas/contaminated soils, including, but not limited to, moisture content, grain size distribution, and total organic carbon. As part of the Pre-Design Work Plan, Settling Defendants shall develop the sampling plan necessary to conduct this sampling activity.

The pilot study location shall be in an area of the On-site Area with representative contamination and geology. A sampling grid will be established that includes sampling nodes at a variety of distances from extraction wells. Pre-treatment analysis for Volatile Organic Compounds (VOCs) and Semi-volatile Organic Compounds (SVOCs) in soil and soil gas will be accomplished at each node. Wellhead gas, separator outlet gas, and separator drain water will be sampled at 8-hour intervals for the first week of the pilot study, at 12-

hour intervals for the second week, and daily thereafter. The mass of removed contaminants will be totaled. After the performance period is complete, samples will be taken as close as possible to pre-treatment samples and analyzed for the same parameters. A mass balance will be performed for the treatment period. The pilot study results shall be used to predict the feasibility and approximate length of time required for the ISVE technology to attain cleanup standards or appropriate total risk levels for contaminants. Condensate from the pilot study shall be managed in accordance with the approved pre-design. Air emissions from the LTTT system shall not exceed the standards set forth in Section II.F.3.

At the end of the performance period U.S. EPA, in consultation with the State, will determine if in-situ soil vapor extraction will attain the performance standards outlined in Appendix A for these buried wastes. Confirmation sampling will be required. If the U.S. EPA, after consultation with the State, determines that the technology is capable of meeting remediation levels then it may be expanded to unremediated portions of the On-site Area. Enhancements to the ISVE system described below (in the section on treatment of contaminated soils) may also be tested on buried waste materials in an effort to prove potential attainment of cleanup standards outlined in the ROD. If the U.S. EPA, after consultation with the State, determines that ISVE will not attain the performance standards for buried wastes then LTTT will be implemented for all buried wastes. In the event Settling Defendants request that this ISVE pilot study not be implemented or be abandoned after implementation, and U.S. EPA, after consultation with the State, approves the request, Settling Defendants shall implement LTTT for all buried wastes.

The potential benefit derived from successful demonstration of ISVE's effectiveness on On-site Area buried waste would be a decrease in the overall cost of remediation and a reduction of the amount of material that would have to be handled for LTTT. If the technology doesn't provide a potential to meet remediation levels or if pilot studies are not conducted then LTTT will be implemented for all buried wastes and contaminated soils.

Even if the pilot study fails to demonstrate that ISVE can meet remediation levels for both buried wastes and contaminated soils, the potential decrease in VOCs might negate the need for elaborate VOC emission control during buried waste excavation, contaminated soil excavation, drum removal, and transportation of waste material and contaminated soil to the Off-site Area LTTT System.

Regardless of the pilot study results, LTTT will be implemented and completed for buried wastes in the Off-site Area. U.S. EPA and the State have determined that an in-situ technology (i.e. ISVE) is not appropriate for the Off-site Area due to the large number and random distribution of buried drums. However, additional pilot scale testing on other innovative technologies may be conducted providing such testing does not delay the current remediation schedule involving LTTT.

4. Treatment of Contaminated Soils

The Settling Defendants shall treat all soil that contains hazardous substances, pollutants or contaminants that exceed the performance standards outlined in Appendix A. Settling Defendants shall perform treatability tests designed to determine if ISVE can achieve remediation levels set forth in Appendix A. If it is determined by U.S. EPA, after consultation with the State, through treatability testing that performance standards cannot be met by the ISVE technology then contaminated soil will be excavated, treated by LTTT to performance standards, and redeposited. The Settling Defendants shall manage condensate from the treatment process in accordance with the approved design. Air emissions from the LTTT system shall not exceed the standards set forth in Section II.F.3.

During the course of the ISVE implementation, if either the Settling Defendants or U.S. EPA, after reasonable opportunity for review and comment by the State, determine that the removal of contaminants can be enhanced by pulsing either the entire ISVE system or individual wells, U.S. EPA may, at its option, require the Settling Defendants to operate the system in that manner.

During the first six months after initiating the full-scale ISVE system, the Settling Defendants shall perform a Feasibility Test to examine the efficacy of adding essential nutrients (e.g., moisture, nitrogen, and phosphate) as part of the ISVE system to enhance the natural microbial degradation of organic compounds. The Feasibility Test shall be subject to the supervision and review of the U.S. EPA and the State. The objective of the Feasibility Test is to determine the optimum amounts of nutrients to be added to the soils in order to promote the natural microbial activities, without decreasing the effectiveness of the removal of contaminants by ISVE. At the conclusion of the Feasibility Test period, the Settling Defendants shall present the results of this study to the U.S. EPA and the State in the form of a written report. The underlying data developed during the Feasibility Test shall be made available to the U.S. EPA and the State upon request. Based on the results of the Feasibility Test, U.S.

EPA, after reasonable opportunity for review and comment by the State, may require the Settling Defendants to implement the addition of essential nutrients to the soils.

The Settling Defendants shall describe the method of conducting the Feasibility Test in the Remedial Design Work Plan.

5. Treatability Testing

Treatability testing for LTTT and ISVE shall be performed during the pre-design task outlined in Section III of this SOW (Task 1). Specific treatability test procedures shall be outlined in the Pre-Design Work Plan.

Settling Defendants shall perform treatability tests designed to determine LTTT operating parameters needed to achieve the cleanup levels set forth in Appendix A. Settling Defendants may only use LTTT units having the ability to remove PCBs to levels meeting the PCB Cleanup Standard, and shall provide to U.S. EPA and the State data demonstrating that ability. If U.S. EPA, after reasonable opportunity for review and comment by the State, determines that the treatability tests show that the performance standards can be achieved by LTTT, Settling Defendants shall design, construct, and operate an LTTT system. The LTTT system shall not be demobilized until U.S. EPA, after reasonable opportunity for review and comment by the State, determines that all material is treated by LTTT as required by this remedy.

Settling defendants shall also perform treatability tests to determine whether ISVE of contaminated soils can achieve the performance standards in Appendix A. If U.S. EPA, after reasonable opportunity for review and comment by the State, determines that the treatability tests show that the performance standards can be achieved by ISVE, Settling Defendants shall design, construct, and operate an ISVE system. If U.S. EPA, after reasonable opportunity for review and comment by the State, determines that the treatability tests show that contaminated soils cannot be remediated to performance standards by ISVE, then Settling Defendants shall treat contaminated soils by LTTT.

F. Installation and Operation of Monitoring Program for Remedial Action

Settling Defendants shall implement monitoring program(s) to:

- immediately assess completed exposure pathways to upper and lower aquifer contaminants to assess the need for

residential well closures or ground water use advisories;

- o assess the need for air emission controls during excavation activities; and

- o evaluate and ensure that the construction and implementation of the Remedial Action comply with approved plans and the approved design and performance standards.

Settling Defendants shall submit monitoring programs as part of the Pre-Design Work Plan and the Remedial Design Work Plan, which shall address the specific components of the remedial action identified in the ROD and this SOW. Each sample shall be analyzed for a list of parameters approved by U.S. EPA, after reasonable opportunity for review and comment by the State.

1. Residential well monitoring

The Settling Defendants shall implement a residential well monitoring program as identified in the Pre-Design Work Plan or as required by U.S. EPA, after reasonable opportunity for review and comment by the State. The Settling Defendants shall design a residential well monitoring program for both upper and lower aquifer wells capable of evaluating potential exposure to contaminated ground water for all nearby residents. The monitoring program shall specify the frequency, duration, and compounds to be analyzed. The program shall include a contingency plan for well closure and ground water use advisories if those are determined by U.S. EPA, in consultation with the State, to be necessary.

2. Groundwater Monitoring

The Settling Defendants shall implement a groundwater monitoring program as identified in the RD Work Plan or as required by U.S. EPA. The Settling Defendants shall design a groundwater monitoring program to detect changes in the chemical concentration of the groundwater at and adjacent to the site.

Upon lodging of the Consent Decree, Settling Defendants shall sample the monitoring wells identified by U.S. EPA, after reasonable opportunity for review and comment by the State, (and those subsequently included in the approved RD Work Plan) on a quarterly basis, and analyze the samples for the parameters listed in Appendix B.

During construction of the groundwater treatment system, the Settling Defendants shall sample and analyze ground water on a quarterly basis, at the locations identified in RD Work Plan

and analyze for the sampling parameters listed in Appendix B. Analysis shall be sent to U.S. EPA and the State.
After construction of the groundwater treatment system, Settling Defendants shall continue sampling and analysis of groundwater at and adjacent to the Site for a minimum of 30 years at the locations identified in the RD Work Plan and analyze for the sampling parameters listed in Appendix B to ensure continued attainment of performance standards. If performance standards are not maintained Settling Defendants shall renew pumping of the ground water to the ground water treatment system until it is demonstrated that none of the contaminants exceed any performance standard in any of the wells in the monitoring network for a period of three years. At that time, Settling Defendants shall begin monitoring the site, as described above, for a minimum of 30 years.

If additional information indicates that the groundwater monitoring program is inadequate, U.S. EPA, after reasonable opportunity for review and comment by the State, may require additional groundwater monitoring wells and laboratory analysis of additional parameters.

3. Air Monitoring

At all times during the performance of the Remedial Action, Settling Defendants shall ensure that air emissions from treatment units and excavation activities do not exceed a cumulative cancer risk of 1 x 10-5 for any receptor, using risk calculation methods set forth in Risk Assessment Guidance for Superfund. In addition, the air emissions shall not exceed any ARARs. If air emissions exceed these levels, Settling Defendants shall take corrective measures immediately, as defined in the RD Work Plan. The Settling Defendants shall submit, as part of the RD Work Plan, an air emission monitoring program, specifying the frequency, duration, and compounds to be analyzed. Such program shall be subject to approval by the U.S. EPA, in consultation with the State. Residuals from air emissions control processes shall be treated and/or disposed of off-site.

4. Extraction/Treatment System Monitoring

The Settling Defendants shall initiate a monitoring program for the Ground water extraction/treatment system as identified in the RD Work Plan or as required by U.S. EPA, after reasonable opportunity for review and comment by the State. The monitoring program shall be designed to detect any conditions that may interfere with the proper operation and function of the system. System monitoring shall include collection and field/laboratory analysis of effluent samples

to determine the effectiveness of the treatment system. Sampling shall occur on a weekly basis, for a period of 8 weeks. Once the remedial action is determined to be both operational and functional, the Settling Defendants shall follow the sampling procedures and frequencies established in the RD/RA Workplan.

5. Points of Compliance

In order to monitor and evaluate the remedial actions throughout the Site, certain locations at which there are groundwater monitoring wells shall be selected as points of compliance. Wells designated as representing the Points of Compliance, and which shall be sampled shall be identified in the Pre-Design Work Plan. All these wells shall be considered as groundwater points of compliance. The wells shall be grouped into wells for detection monitoring and wells for compliance monitoring. If any of the wells in any way become unusable, the Settling Defendants shall repair or replace each well. Additional wells may be required by U.S. EPA, after reasonable opportunity for review and comment by the State, during the development of the RD/RA Work Plan and the Operation and Maintenance (O&M) Plan. The location of any additional wells installed pursuant to the Consent Decree or this SOW shall be approved by the U.S. EPA, after reasonable opportunity for review and comment by the State. Detection monitoring shall be conducted in accordance with this SOW, and consistent with the Consent Decree. Compliance monitoring shall be conducted in accordance with this SOW, and consistent with the Consent Decree.

III. SCOPE OF REMEDIAL DESIGN AND REMEDIAL ACTION

The Remedial Design/Remedial Action shall consist of seven tasks. All plans are subject to EPA approval.

Task 1: Pre-Design Work Plan

Task 2: Remedial Design Work Plan

Task 3: Remedial Design Phases

A. Preliminary Design
B. Intermediate Design
C. Prefinal Design/ Final Design

Task 4: Remedial Action Work Plan

Task 5: Remedial Action/Construction

A. Preconstruction Meeting

B. Prefinal Inspection
C. Final Inspection
D. Reports

1. Final Construction Report
2. Completion of Remedial Action Report
3. Completion of Work Report

Task 6: Operation and Maintenance

Task 7: Performance Monitoring

Task 1: Pre-Design Work Plan

The Settling Defendants shall submit a Pre-Design Work Plan that shall document the overall management strategy for performing pre-design studies to supplement the available technical data and to provide information necessary to fully implement the Remedial Design and Remedial Action. The Settling Defendants shall implement the pre-design work in accordance with the final Pre-Design Work Plan. This pre-design work plan shall include, at a minimum:

- Perimeter fence installation;
- Excavation and offsite disposal plan for intact buried drums in the On-site Containment Area;
- Investigations in the wetlands;
- Identification of compliance and detection monitoring wells;
- Residential well sampling to immediately assess completed exposure pathways to upper and lower aquifer contaminants and the need for well closures or ground water use advisories;
- An ISVE pilot study for On-site Area buried wastes;
- Treatability studies for LTTT and ISVE effectiveness on buried wastes and contaminated soils;
- Refining lead cleanup levels using the Biokinetic Uptake Model; and
- Provisions for any other testing needed for pre-design purposes.

The plan shall document the responsibility and authority of all organizations and key personnel involved with the implementation of the remedy and shall include a description

of qualifications of key personnel directing the Remedial Design, including contractor personnel. The Work Plan shall also contain a schedule of Pre-Design activities.

This Pre-Design Work Plan shall include, at a minimum, a pre-design Quality Assurance Project Plan (QAPP), Health and Safety Plan, Field Sampling Plan and schedule to delineate the extent of contamination in the wetlands.

All principal personnel involved in the development of the work plan for pre-design studies shall meet with U.S. EPA and State representatives prior to submitting this work plan in order to discuss program elements including objectives, resources, communication channels, and roles.

At the direction of the U.S. EPA, after reasonable opportunity for review and comment by the State, Settling Defendants shall furnish all services for any such studies required, including field work, materials, supplies, labor, equipment, and data interpretation. Sufficient sampling, testing and analysis shall be performed to optimize the required treatment and/or disposal operations and systems.

Settling Defendants shall submit to U.S. EPA and the State a final pre-design report which includes the results of all pre-design studies, recommendations based on results of the studies, and all data collected during the studies.

Task 2: Remedial Design Work Plan

The Settling Defendants shall submit a Work Plan which shall document the overall management strategy for performing the design, construction, operation, maintenance and monitoring of Remedial Actions for U.S. EPA review and approval. The plan shall document the responsibility and authority of all organizations and key personnel involved with the implementation and shall include a description of qualifications of key personnel directing the Remedial Design, including contractor personnel. The Work Plan shall also contain a schedule of Remedial Design activities. The Settling Defendants shall submit a Remedial Design Work Plan in accordance with § XII and paragraph 11 of the Consent Decree and Section V of this SOW. This RD Work Plan shall include, at a minimum, a design QAPP, Health and Safety Plan, and Field Sampling Plan.

Task 3: Remedial Design Phases

Settling Defendants shall prepare construction plans and specifications to implement the Remedial Actions at the Site as described in the ROD and this SOW. Plans and

specifications shall be submitted in accordance with the schedule set forth in Section V below. Subject to approval by U.S. EPA, after reasonable opportunity for review and comment by the State, Settling Defendants may submit more than one set of design submittals reflecting different components of the Remedial Action. All plans and specifications shall be developed in accordance with U.S. EPA's Superfund Remedial Design and Remedial Action Guidance (OSWER Directive No. 9355.0-4A) and shall be developed to ensure that the Remedial Action shall meet all objectives of the ROD , the CD and this SOW, including all performance standards. Settling Defendants shall meet regularly with U.S. EPA and the State to discuss design issues.

A. Preliminary Design

Settling Defendants shall submit the Preliminary Design when the design effort is approximately 30 % complete. The Preliminary Design submittal shall include or discuss, at a minimum, the following:

- Preliminary plans, drawings, and sketches, including design calculations;
- Results of treatability studies and additional field sampling;
- Design assumptions and parameters, including design restrictions, process performance criteria, appropriate unit processes for the treatment train, and expected removal or treatment efficiencies for both the process and waste (concentration and volume);
- Proposed cleanup verification methods, including compliance with Applicable or Relevant and Appropriate Requirements (ARARs);
- Outline of required specifications;
- Proposed siting/locations of processes/construction activity;
- Expected long-term monitoring and operation requirements;
- Real estate, easement, and permit requirements;
- Preliminary construction schedule, including contracting strategy.

B. Intermediate Design

Settling Defendants shall submit the Intermediate Design when the design effort is approximately 60 % complete. The Intermediate Design shall fully address all comments made to the preceding design submittal. The Intermediate Design submittal shall include those elements listed for the Preliminary Design, as well as, the following:

- Draft Performance Standard Verification Plan;
- Draft Construction Quality Assurance Plan;
- Draft QAPP, Draft Health and Safety Plan, Draft Field Sampling Plan, Draft Contingency Plan

C. Prefinal and Final Designs

Settling Defendants shall submit the Prefinal Design when the design effort is 95% complete and shall submit the Final Design when the design effort is 100% complete. The Prefinal Design shall fully address all comments made to the preceding design submittal. The Final Design shall fully address all comments made to the Prefinal Design and shall include reproducible drawings and specifications suitable for bid advertisement. The Prefinal Design shall serve as the Final Design if U.S. EPA has no further comments and issues the notice to proceed.

The Prefinal and Final Design submittals shall include those elements listed for the Preliminary Design, as well as, the following:

- Final Performance Standard Verification Plan;
- Final Construction Quality Assurance Plan;
- Final QAPP, Final Health and Safety Plan, Final Field Sampling Plan, Final Contingency Plan;
- Draft Operation and Maintenance Plan;
- Capital and Operation and Maintenance Cost Estimate. This cost estimate shall refine the FS cost estimate to reflect the detail presented in the Final Design;
- Final Project Schedule for the construction and implementation of the Remedial Action which identifies timing for initiation and completion of all critical path tasks. The final project schedule submitted as part of the Final Design shall include specific dates for completion of the project and major milestones.

Task 4: Remedial Action Work Plan

The Settling Defendants shall submit a Remedial Action Work Plan which includes a detailed description of the remediation and construction activities. The RA Work Plan shall include a project schedule for each major activity and submission of deliverables generated during the Remedial Action. The Settling Defendants shall submit a Remedial Action Work Plan in accordance with § XII and paragraph 12 of the Consent Decree and Section V of this SOW.

Task 5: Remedial Action Construction

The Settling Defendants shall implement the Remedial Action as detailed in the approved Final Design. The following activities shall be completed in constructing the Remedial Action.

A. Preconstruction inspection and meeting:

The Settling Defendants shall participate with the U.S. EPA and the State in a preconstruction inspection and meeting to:

a. Review methods for documenting and reporting inspection data;

b. Review methods for distributing and storing documents and reports;

c. Review work area security and safety protocol;

d. Discuss any appropriate modifications of the construction quality assurance plan to ensure that site-specific considerations are addressed; and,

e. Conduct a Site walk-around to verify that the design criteria, plans, and specifications are understood and to review material and equipment storage locations.

The preconstruction inspection and meeting shall be documented by a designated person and minutes shall be transmitted to all parties.

B. Prefinal inspection:

Within 15 days after Settling Defendants make a preliminary determination that construction is complete, the Settling Defendants shall notify the U.S. EPA and the State for the purposes of conducting a prefinal inspection. The prefinal inspection shall consist of a walk-through inspection of the

entire Facility with U.S. EPA and the State. The inspection is to determine whether the project is complete and consistent with the contract documents and the Remedial Action. Any outstanding construction items discovered during the inspection shall be identified and noted. Additionally, treatment equipment shall be operationally tested by the Settling Defendants. The Settling Defendants shall certify that the equipment has performed to meet the purpose and intent of the specifications. Retesting shall be completed where deficiencies are revealed. The prefinal inspection report shall outline the outstanding construction items, actions required to resolve items, completion date for these items, and a proposed date for final inspection.

C. Final inspection:

Within 15 days after completion of any work identified in the prefinal inspection report, the Settling Defendants shall notify the U.S. EPA and the State for the purposes of conducting a final inspection. The final inspection shall consist of a walk-through inspection of the Facility by U.S. EPA, the State, and the Settling Defendants. The prefinal inspection report shall be used as a checklist with the final inspection focusing on the outstanding construction items identified in the prefinal inspection. Confirmation shall be made that outstanding items have been resolved.

D. Reports

1. Final Construction Report

This report shall be submitted by the Settling Defendants when construction is complete, but performance standards have not yet been attained.

Within 30 days of a successful final inspection, Settling Defendants shall submit a Construction Completion Report. In the report, a registered professional engineer and the Settling Defendants' Project Coordinator shall state that the Remedial Action has been constructed in accordance with the design and specifications. The written report shall include as-built drawings signed and stamped by a professional engineer. The report shall contain the following statement, signed by a responsible corporate official of a Settling Defendant or the Settling Defendants' Project Coordinator:

"To the best of my knowledge, after thorough investigation, I certify that the information contained in or accompanying this submission is true, accurate and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

2. Completion of Remedial Action Report

This report shall be submitted by the Settling Defendants when construction is complete and performance standards have been attained and where O&M requirements will continue to be performed.

Within 30 days of a successful final inspection, Settling Defendants shall submit a Completion of Remedial Action Report. In the report, a registered professional engineer and the Settling Defendants' Project Coordinator shall state the Remedial Action has been completed in full satisfaction of the requirements of this Consent Decree. The written report shall include as-built drawings signed and stamped by a professional engineer. The report shall contain the following statement, signed by a responsible corporate official of a Settling Defendant or the Settling Defendants' Project Coordinator:

"To the best of my knowledge, after thorough investigation, I certify that the information contained in or accompanying this submission is true, accurate and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

3. Completion of Work Report

This report shall be submitted by the Settling Defendants when construction is complete, performance standards have been attained and O & M is complete or not required.

Within 30 days of a successful final inspection, Settling Defendants shall submit a Completion of Work Report. In the report, a registered professional engineer and the Settling Defendants' Project Coordinator shall state that all work, including O & M, has been completed in full satisfaction of the requirements of this Consent Decree. The written report shall include as-built drawings signed and stamped by a professional engineer not previously submitted. The report shall contain the following statement, signed by a responsible corporate official of a Settling Defendant or the Settling Defendants' Project Coordinator:

"To the best of my knowledge, after thorough investigation, I certify that the information contained in or accompanying this submission is true, accurate and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Task 6: Operation and Maintenance

The Settling Defendants shall prepare an Operation and Maintenance (O&M) Plan to cover both implementation and long term maintenance of the Remedial Actions. An initial Draft O&M Plan shall be submitted as a final Design Document submission. The final O&M Plan shall be submitted to U.S. EPA and the State prior to the pre-final construction inspection, in accordance with the approved construction schedule. The plan shall be composed of the following elements:

1. Description of normal operation and maintenance;

    a. Description of tasks for operation;
    b. Description of tasks for maintenance;
    c. Description of prescribed treatment or operation conditions; and
    d. Schedule showing frequency of each O&M task.

2. Description of potential operating problems;

    a. Description and analysis of potential operation problems;
    b. Sources of information regarding problems; and
    c. Common and/or anticipated remedies.

3. Description of routine monitoring and laboratory testing;

    a. Description of monitoring tasks;
    b. Description of required data collection, laboratory tests and their interpretation;
    c. Required quality assurance, and quality control;
    d. Schedule of monitoring frequency and procedures for a petition to U.S. EPA and the State to reduce the frequency of or discontinue monitoring; and
    e. Description of verification sampling procedures if Cleanup or Performance Standards are exceeded in routine monitoring.

4. Description of alternate O&M;

    a. Should systems fail, alternate procedures to prevent release or threatened releases of hazardous substances, pollutants or contaminants which may endanger public health and the environment or exceed performance standards; and
    b. Analysis of vulnerability and additional resource requirements should a failure occur.

5. Corrective Action;

   a. Description of corrective action to be implemented in the event that cleanup or performance standards are exceeded; and
   b. Schedule for implementing these corrective actions.

6. Safety plan;

   a. Description of precautions, of necessary equipment, etc., for Site personnel; and
   b. Safety tasks required in the event of systems failure.

7. Description of equipment; and

   a. Equipment identification;
   b. Installation of monitoring components;
   c. Maintenance of Site equipment; and
   d. Replacement schedule for equipment and installed components.

8. Records and reporting mechanisms required.

   a. Daily operating logs;
   b. Laboratory records;
   c. Records for operating costs;
   d. Mechanism for reporting emergencies;
   e. Personnel and maintenance records; and
   f. Monthly/annual reports to State agencies.

Task 7: Performance Monitoring

Performance monitoring shall be conducted to ensure that all Performance Standards are met.

A. Performance Standard Verification Plan

The purpose of the Performance Standard Verification Plan is to provide a mechanism to ensure that both short-term and long-term Performance Standards for the Remedial Action are met. The Draft Performance Standards Verification Plan shall be submitted with the Intermediate Design. Once approved, the Performance Standards Verification Plan shall be implemented on the approved schedule. The Performance Standards Verification Plan shall include:

1. Quality Assurance Project Plan
2. Health and Safety Plan
3. Field Sampling Plan

IV CONTENT OF SUPPORTING PLANS

The documents listed in this section -- the Quality Assurance Project Plan, the Field Sampling Plan, the Health and Safety Plan, the Contingency Plan and the Construction Quality Assurance Plan -- are documents which must be prepared and submitted as outlined in Section III of this SOW. The following section describes the required contents of each of these supporting plans.

A. Quality Assurance Project Plan

The Settling Defendants shall develop a Site specific Quality Assurance Project Plan (QAPP), covering sample analysis and data handling for samples collected in all phases of future Site work, based upon the Consent Decree and guidance provided by U.S. EPA and the State. The QAPP shall be consistent with the requirements of the EPA Contract Lab Program (CLP) for laboratories proposed outside the CLP. The QAPP shall at a minimum include:

1. Project Description

- Facility Location History
- Past Data Collection Activity
- Project Scope
- Sample Network Design
- Parameters to be Tested and Frequency
- Project Schedule

Project Organization and Responsibility

Quality Assurance Objective for Measurement Data

- Level of Quality Control Effort
- Accuracy, Precision and Sensitivity of Analysis
- Completeness, Representativeness and Comparability

Sampling Procedures

Sample Custody

- Field Specific Custody Procedures
- Laboratory Chain of Custody Procedures

Calibration Procedures and Frequency

- Field Instruments/Equipment
- Laboratory Instruments

Analytical Procedures

- Non-Contract Laboratory Program Analytical Methods
- Field Screening and Analytical Protocol
- Laboratory Procedures

Internal Quality Control Checks

- Field Measurements
- Laboratory Analysis

Data Reduction, Validation, and Reporting

- Data Reduction
- Data Validation
- Data Reporting

Performance and System Audits

- Internal Audits of Field Activity
- Internal Laboratory Audit
- External Field Audit
- External Laboratory Audit

Preventive Maintenance

- Routine Preventative Maintenance Procedures and Schedules
- Field Instruments/Equipment
- Laboratory Instruments

Specific Routine Procedures to Assess Data Precision, Accuracy, and Completeness

- Field Measurement Data
- Laboratory Data

Corrective Action

- Sample Collection/Field Measurement
- Laboratory Analysis

Quality Assurance Reports to Management

The Settling Defendants shall attend a pre- QAPP meeting with U.S. EPA and the State. The Settling Defendants shall submit a draft QAPP to U.S. EPA and the State for review and approval by U.S. EPA, after reasonable opportunity for review and comment by the State.

B. Health and Safety Plan

The Settling Defendants shall develop a health and safety plan which is designed to protect on-site personnel and area residents from physical, chemical and all other hazards posed by this remedial action. The safety plan shall develop the performance levels and criteria necessary to address the following areas.

- Facility Description
- Access Control
- Personnel
- Levels of protection
- Safe work practices and safe guards
- Medical surveillance
- Personal and environmental air monitoring
- Personal protective equipment
- Personal hygiene
- Decontamination - personal and equipment
  Site work zones
- Contaminant control
- Contingency and emergency planning
- Logs, reports and record keeping

The safety plan shall follow U.S. EPA and State guidance and all OSHA requirements as outlined in 29 CFR 1910 and 1926.

C. Contingency Plan

Settling Defendants shall submit a Contingency Plan describing procedures to be used in the event of an accident or emergency at the site. The draft Contingency Plan shall be submitted with the prefinal design and the final Contingency Plan shall be submitted with the final design. The Contingency Plan shall include, at a minimum, the following:

1. Name of the person or entity responsible for responding in the event of an emergency incident.

2. Plan and date(s) for meeting(s) with the local community, including local, State and Federal agencies involved in the cleanup, as well as local emergency squads and hospitals.

3. First aid medical information.

4. Air Monitoring Plan (if applicable).

5. Spill Prevention, Control, and Countermeasures (SPCC) Plan (if applicable), as specified in 40 CFR Part 109 describing measures to prevent and contingency plans for

potential spills and discharges from materials handling and transportation.

D. Field Sampling Plan

The Settling Defendants shall develop a field sampling plan (as described in "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA," October 1988). The Field Sampling Plan should supplement the QAPP and address all sample collection activities. Sample collection activities shall include, at a minimum, the following elements:

- Site background
- Sampling objectives
- Sample location and frequency
- Sample description
- Sampling equipment and procedures
- Sample handling and analysis

E. Construction Quality Assurance Plan

Settling Defendants shall submit a Construction Quality Assurance Plan (CQAP) describes the Site specific components of the quality assurance program which shall ensure that the completed project meets or exceeds all design criteria, plans, and specifications. The draft CQAP shall be submitted with the prefinal design and the final CQAP shall be submitted with the final design. The CQAP shall contain, at a minimum, the following elements:

1. Responsibilities and authorities of all organizations and key personnel involved in the design and construction of the Remedial Action.

2. Qualifications of the Quality Assurance Official to demonstrate he possesses the training and experience necessary to fulfill his identified responsibilities.

3. Protocols for sampling and testing used to monitor construction.

4. Identification of proposed quality assurance sampling activities including the sample size, locations, frequency of testing, acceptance and rejection data sheets, problem identification and corrective measures reports, evaluation reports, acceptance reports, and final documentation. A description of the provisions for final storage of all records consistent with the requirements of the Consent Decree shall be included.

5. Reporting requirements for CQAP activities shall be described in detail in the CQAP. This shall include such items as daily summary reports, inspection data sheets, problem identification and corrective measures reports, design acceptance reports, and final documentation. Provisions for the final storage of all records shall be presented in the CQAP.

V. SUMMARY OF MAJOR DELIVERABLES/SCHEDULE

A summary of the project schedule and reporting requirements contained in this SOW is presented below:

Submission		Due Date
1.	Pre-design Work Plan	Sixty (60) days after Notice of Authorization to proceed pursuant to Paragraph 10 of Consent Decree
2.	RD Work Plan	Thirty (30) days after U.S. EPA's Approval of Final Pre-Design Work Plan
3.	Preliminary Design (30%)	Thirty (30) days after U.S. EPA's approval of Final RD Work Plan
4.	Intermediate Design (60%)	Thirty (30) days after receipt of U.S. EPA's comments on the Preliminary Design
5.	Prefinal Design (95%)	Thirty (30) days after receipt of U.S. EPA's comments on the Intermediate Design
6.	Final Design (100%)	Thirty (30) days after receipt of U.S. EPA's comments on the Prefinal Design
7.	RA Work Plan	Thirty (30) days after U.S. EPA's approval of the final design submittal

8.	Award RA Contract(s)	Thirty (30) days after receipt of U.S. EPA's Notice of Authorization to Proceed with RA
9.	Pre-Construction Inspection and Meeting	(15) days after Award of RA Contract(s)
10.	Initiate Construction of RA	15 days after Pre-Construction Inspection and meeting
11.	Completion of Construction	15 days after receipt of U.S. EPA's authorization to proceed with RA or as approved by U.S. EPA in RA construction schedule
12.	Prefinal Inspection	No later than 15 days after completion of construction
13.	Prefinal Inspection Report	15 days after completion of prefinal inspection
14.	Final Inspection	15 days after completion of work identified in prefinal inspection report
15.	Final O&M Plan	No later than Prefinal Inspection
16.	Construction Completion Report	30 days after final inspection
17.	Final Construction Report	30 days after final construction
18.	Completion of Remedial Action Report	30 days after final inspection
19.	Completion of Work Report	See Consent Decree and Task 4.D.3 of this SOW

APPENDIX A

The following buried waste and contaminated soils will be excavated and treated by low temperature thermal treatment (LTTT) to meet clean up levels: 1) buried wastes in the Off-site Area; 2) soils contaminated with PCBs at a level greater than 10 ppm in both the On-site and Off-site Areas; and 3) isolated VOC-contaminated soil not within the areas to be addressed by In-situ Soil Vapor Extraction (ISVE). All LTTT residuals will be deposited back into the excavations after meeting appropriate health-based remediation levels identified below. LTTT treatment residuals can contain up to 2 ppm PCBs, however, in order to be used as cover material treatment residuals must not contain more than 1 ppm total PCBs.

All buried waste and soil will be treated to a cumulative carcinogenic risk of 3.3 x 10-5, and a cumulative noncancer risk of HI < 1. For carcinogenic contaminants, these remediation levels represent carcinogenic risk of 1 x 10-6 for individual contaminants. Based on the number of carcinogenic contaminants, the cumulative risk that must be attained is therefore 3.3 x 10-5 for carcinogenic contaminants.

For noncancer contaminants, these remediation levels represent a noncancer risk of HQ = 1 for individual contaminants. The range given for individual noncancer contaminants is based on the number of noncancer contaminants detected in site soils. The actual remediation level will depend on how many noncancer contaminants are detected in the particular remediation area and must represent a cumulative HI < 1.0.

Technology limitations and detection limits may affect the attainment of these levels for individual contaminants, however, the cumulative risk must meet 3.3 x 10-5 cumulative cancer risk and a cumulative HI < 1.0 total noncancer risk.

The cleanup level of 500 ppm lead for contaminated soils is based on the Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund Sites (OSWER Directive 9355.4-02). This guidance sets a clean-up range of 500-1000 ppm lead. The most conservative value was chosen due to the large number and high levels of other site contaminants. This clean-up level for lead may need further evaluation and refinement through the use of the U.S. EPA Uptake Biokinetic (UBK) Model, as required in pre-design.

Isolated pockets of heavy metal-contaminated soils greater than 500 ppm lead in both the On-Site and Off-Site Areas will also be excavated, may be treated by LTTT to remove VOCs and SVOCs, possibly immobilized to remove the hazardous waste characteristic for metals, and sent off-site for disposal.

The cleanup level of 10 ppm PCBs with 10" soil cover is based on TSCA policy for unrestricted access. U.S. EPA guidance suggests a concentration of 1 ppm for PCB cleanup based on the standard exposure assumptions under the residential use scenario. A ten inch soil cover has been estimated to give an additional order of

magnitude protection. Therefore, a cleanup level of 10 ppm with 10" of clean soil cover would provide protection at the 10-5 level. Soil and waste exceeding 10 ppm will be treated to 2 ppm PCBs in order to achieve a clean up level equivalent to incineration. If treatment of soil and waste cannot achieve 2 ppm, the soil and waste will be sent offsite in compliance with TSCA.

PCB treatment criteria cannot be met through dilution of material to be treated. Treatability studies will need to be conducted to determine if LTTT can treat to 2 ppm total PCBs. If the technology fails to meet this cleanup objective then PCB contaminated soils greater than 10 ppm must be sent offsite to a licensed TSCA landfill or incinerator.

Final Remediation Levels from ROD			Corresponding Risk	
Chemical	Remediation Level mg/kg	Basis	Cancer	NonCancer
CPAHs	0.0026	Risk	1.0E-06	NA
Tetrachloroethene	1.1	Risk	1.0E-06	NA
bis(2-Ethylhexyl) phthalate	1.1	Risk	1.0E-06	NA
Aldrin	0.002	Risk	1.0E-06	NA
Tricholorethene	5.3	Risk	1.0E-06	NA
Isophorone	7.2	Risk	1.0E-06	NA
Styrene	1.7	Risk	1.0E-06	NA
Pentachlorophenol	0.43	Risk	1.0E-06	NA
Benzene	1.0	Risk	1.0E-06	NA
4,4'-DDD	0.12	Risk	1.0E-06	NA
2,4-Dinitrotoluene	0.044	Risk	1.0E-06	NA
1,1-Dichloroethene	0.098	Risk	1.0E-06	NA
Carbon Tetra-Chloride	0.38	Risk	1.0E-06	NA
bis(2-Chloroethyl) ether	0.027	Risk	1.0E-06	NA
4,4'DDT	0.088	Risk	1.0E-06	NA
Chloroform	9.5	Risk	1.0E-06	NA

Hexachlorobutadiene	0.36	Risk	1.0E-06	NA
1,2-Dichloroethane	0.64	Risk	1.0E-06	NA
Methylene Chloride	6.2	Risk	1.0E-06	NA
1,2-Dichloropropane	0.42	Risk	1.0E-06	NA
Hexachlorobenzene	0.018	Risk	1.0E-06	NA
gamma-BHC (Lindane)	0.046	Risk	1.0E-06	NA
Cyclic Ketones	7.3	Risk	1.0E-06	NA
1,1,2-Trichloroethane	0.51	Risk	1.0E-06	NA
n-Nitrosodiphenylamine	12.0	Risk	1.0E-06	NA
1,1,2,2-Tetrachloroethane	0.28	Risk	1.0E-06	NA
Vinyl Chloride	0.031	Risk	1.0E-06	NA
alpha-BHC	0.0047	Risk	1.0E-06	NA
beta-BHC	0.016	Risk	1.0E-06	NA
2,6-Dinitrotoluene	0.044	Risk	1.0E-06	NA
4,4'-DDE	0.16	Risk	1.0E-06	NA
1,4-Dichlorobenzene	2.4	Risk	1.0E-06	NA
Heptachlor Epoxide	0.0033	Risk	1.0E-06	NA
Antimony	15 - 0.5	HI	NA	1.0-0.03
Toluene	5,000 - 167	HI	NA	1.0-0.03
Cadmium	51 - 2	HI	NA	1.0-0.03
Ethylbenzene	1,300 - 43	HI	NA	1.0-0.03
Barium	2,600 - 87	HI	NA	1.0-0.03

Chromium (VI)	1,400 - 47	HI	NA	1.0-0.03
Naphthalene	82 - 3	HI	NA	1.0-0.03
Nitrogenated Benzenes	6.2 - 0.2	HI	NA	1.0-0.03
n-Chain Alkanes	760 - 25	HI	NA	1.0-0.03
1,1,1-Trichloro-ethane	2,300 - 77	HI	NA	1.0-0.03
Branched Alkanes	770 - 26	HI	NA	1.0-0.03
4-Methyl-2-pentanone	630 - 21	HI	NA	1.0-0.03
Methyl Proply Benzenes	490 - 16	HI	NA	1.0-0.03
Halogentaed Alkanes	2,300 - 77	HI	NA	1.0-0.03
Endosulfan I	0.63 - 0.02	HI	NA	1.0-0.03
Dimethyl Ethyl Benzenes	1,300 - 43	HI	NA	1.0-0.03
1,2-Dichloroethene (cis)	250 - 8.3	HI	NA	1.0-0.03
2-Butanone	620 - 21	HI	NA	1.0-0.03
Non-Cyclic Acids	1,000 - 33	HI	NA	1.0-0.03
Methylated Naphthalenes	85 - 3	HI	NA	1.0-0.03

Acetone	2,400 - 80	HI	NA	1.0-0.03
Chlorobenzene	150 - 5	HI	NA	1.0-0.03
Xylenes (mixed)	26,000 - 867	HI	NA	1.0-0.03
Oxygenated Benzenes	1,200 - 40	HI	NA	1.0-0.03
Diethyl Benzenes	1,300 - 43	HI	NA	1.0-0.03
Propenyl Benzenes	320 - 11	HI	NA	1.0-0.03
Di-n-butylphthalate	2,300 - 77	HI	NA	1.0-0.03
Ethyl Methyl Benzenes	4,900 - 163	HI	NA	1.0-0.03
1,2,4-Trichloro benzene	16 - 0.5	HI	NA	1.0-0.03
Chloroethane	2700 - 90	HI	NA	1.0-0.03

APPENDIX B

Final Remediation Levels from ROD			Corresponding Risk	
Chemical	Remediation Level ug/L	Basis	Cancer	NonCancer
Benzene	5.0	MCL	6.5E-07	NA
Vinyl Chloride	0.25	Risk	1.0E-06	NA
PCBs	0.06	Risk	1.0E-06	NA
bis(2-Chloro-ethyl)ether	21.0	Risk	1.0E-06	NA
Arsenic	8.8	Risk	1.0E-06	<.01
PCE	5.0	MCL	6.2E-07	NA
Methylene Chloride	5.0	MCL	5.4E-07	NA
Chloromethane	8.4	Risk	1.0E-06	NA
Beryllium	0.02	Risk	1.0E-06	NA
Trichloroethene	5.0	MCL	2.1E-07	NA
bis(2-Ethylhexyl) phthalate	5.8	Risk	1.0E-06	NA
Cyclic Ketones	5.8	Risk	1.0E-06	NA
Pentachlorophenol	1.0	MCL	1.5E-06	NA
1,4-Dichlorobenzene	3.3	Risk	1.0E-06	NA
Isophorone	19	Risk	1.0E-06	NA
2-Butanone	24,000 - 2,000	HI	NA	1.0-0.08
4-Methyl-2-pentanone	640 - 53	HI	NA	1.0-0.08
Non-Cyclic Acids	280 - 23	HI	NA	1.0-0.08
Acetone	2,300 - 192	HI	NA	1.0-0.08
Branched Alkanes	210 - 18	HI	NA	1.0-0.08

Ethylbenzene	390 - 33	HI	NA	1.0-0.08
Thallium	2.4 - 0.2	HI	NA	1.0-0.08
Dimethyl Ethyl Benzenes	250 - 21	HI	NA	1.0-0.08
1,2-Dichloroethene (cis)	330 - 28	HI	NA	1.0-0.08
Manganese	3,300 - 275	HI	NA	1.0-0.08
4-Methylphenol	1,700 - 142	HI	NA	1.0-0.08
1,1-Dichloroethane	2,200 - 183	HI	NA	1.0-0.08